



# A COMPARATIVE STUDY OF STUDENTS' ACADEMIC PERFORMANCE IN SCIENCE STREAM UNDER THE EFFECT OF CASTE, REGION, GENDER AND MEDIUM IN SELECTED GOVERNMENT SENIOR SECONDARY SCHOOLS OF PUNJAB STATE

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## ABSTRACT

This research paper investigated the difference of students' academic performance in science stream under the consideration of the effects of Caste, Region and Gender in Government Senior Secondary Schools of Punjab state. Performance on the basis of the medium in the 10th class passed has also been studied. A sample of 10 Schools was drawn from the population through the process of simple random sampling technique, made up of 5 schools in Rural Area and 5 schools in Urban Area. Data is gathered through the review of internal records. The statistical technique of 'Analysis of Variance (ANOVA)' was employed to analyze the data. The results revealed that General caste students from urban and English medium school background have been performing better as compared to others. Also, female students have shown better academic performance as compared to male students.

**Keywords:** Caste, Region, Medium, Gender, senior secondary, academic performance.

## 1. INTRODUCTION

A Senior Secondary Education is considered as the education to be imparted after the Secondary Education. The Classes XI and XII is considered as Senior Secondary Education. In senior secondary schooling, students have to choose stream between any of the streams like Science, Humanities, Commerce, Vocational and Agriculture to complete their Senior Secondary Schooling. Institutions providing this schooling are recognized/approved by a competent authority e.g., Central/State Government or other authorized agencies, e.g., Boards of Secondary Education, UGC, AICTE, MCI, ICAR, Directorates of Education or other duly empowered authority. In these schools, SC (Scheduled Castes), OBC (Other Backward Classes), General and others girl and boy students from rural and urban background are taking their education.

According to Elementary education report 2014-15, there are 20741 govt. schools out of which 1873 are senior secondary schools. In March 2016, nearly 18.34% of the total secondary pass percentage has passed in the science stream. The low pass percentage and performance in science subjects by the students belonging to Scheduled Caste (SC) and rural area is an issue of concern despite of opportunities to realize their rights and potential and this has serious implications on the development of a country that depends heavily on the quality of its human resources. A low participation in these subjects may impact on the level of scientific literacy of a particular portion of the population and the future workforce of the country from this portion will lack important knowledge, conceptual understanding and skills needed for facing the challenges of a fast changing world.

Teena Yadav and Dinesh Chahal (2016) have found that there is no significant difference between male and female students, urban and rural students, government and private students and here is no significant difference between general category students and urban category students. But to some extent region impact the academic achievement of the students. Faiza Shaheen and Fariha Gul (2014) have investigated that there is no significant gender wise difference in achievement scores of students.

Adigun Joseph et al. (2015) have studied that there is no significant difference in students' academic achievement and retention in computer studies on the basis of gender. It was observed by Adeyemo Adeyinka et al. (2013) that the condition of service of teachers, teachers' Fringe benefit payment, and teachers' promotion of in-service training have a direct influence on the student's performance in mathematics.

It is generally believed that just providing the adequate facilities can improve the academic performance of SC and rural students. The low performance of student towards an educational aims and objectives could be associated to the learning environment at home. The academic performance of the child has relationship with the child rearing practices adopted by the parents at home where not only the socioeconomic status of parents play its role but educational level of parents also contributes its part (Ogunshola and Adewale, 2012).

A student getting percentage above 80% in senior secondary examination has been considered 'Super'. If he gets more than 50% but less than or equal to 80% has been considered 'Average', while a student getting percentage less than or equal to 50% has been considered 'Below Average'. The importance of the present study is to focus mainly on the academic performance of government senior

secondary students in science stream in the selected government senior secondary schools in Punjab state on the basis of the difference in caste, region, gender and medium of the class 10th passed.

## 2. RESEARCH QUESTION

This study seeks to find answer to the following question:

- Why do the number of science students showing good performance from the senior secondary schools are mostly general and urban?
- Why do the students who pass class 10th from the Punjabi medium schools are not performing well in science stream?
- What is the effect of gender factor on the academic performance of the students in science stream passing out from the senior secondary schools?

## 3. OBJECTIVES OF THE STUDY

The main objectives of the study are:

- To determine the academic performance of senior secondary SC and general students in science stream.
- To determine the academic performance of senior secondary rural and urban students in science stream.
- To determine the academic performance of senior secondary male and female students in science stream.
- To determine the academic performance of senior secondary students on the basis of medium of class 10th in science stream.

## 4. SIGNIFICANCE OF THE STUDY

This study will help government and policy makers to understand the influence of factors like Caste, region, medium and gender on students' academic performance especially in science stream. It would also enable educationists to structure educational policies in such a way that academic performance of these particular students will be improved. This study would also serve as a tool to clarify issues as to whether present policies have any influence on students' performance in science stream and to make recommendations on how school systems can ameliorate the situation.

## 5. SAMPLE AND SAMPLING TECHNIQUE

The study population comprised of the academic record of old students who have studied in the Science stream in the selected government senior secondary schools of Punjab State. The data was collected by the researchers themselves. It was ensured to the schools that the data will be used for the research purpose only and the information provided by them will be kept confidential. Simple random sampling was used because the study intended to select a representative without bias from the accessible population. This ensured that each member of the target population had an equal and independent chance of being included in the sample.

## 6. DATA ANALYSIS

Comparisons between performances of the students were made using one-way ANOVA, with academic performance as dependent variable and Caste, Region, Gender and medium of class 10th passed as independent variables. The significance level for all statistical tests was 0.05. The techniques of analysis used were one-way ANOVA of analysis using SPSS data statistical package.

## 7. FINDINGS OF THE STUDY

The table 1 shows that of the 524 respondents, 19.8% studied in academic session 2013-14, 22.9% studied in academic session 2014-15, 26.7% studied in academic session 2015-16, while 30.5% studied in academic session 2016-17. This table reveals that numbers of science student are increasing every year. It can also be seen that the majority (53.4%) of the respondents are average followed by below average which account for 24.4 percent of the respondent while super students accounted for low (22.1) percent of the respondents. Also, 32.3% of the respondents are male while the remaining 67.7% of the respondents are female. The table shows that 27.5% of the respondents are SC studying in science stream as compared to strength of General students which accounted for 72.5% of the respondents. Also, majority of the respondents belong to urban area (65.5%) which is quite larger than the respondents belonging to rural area (34.5%). It can be seen that 56.9% respondents have passed class 10<sup>th</sup> in English medium while 43.1% respondents have passed class 10<sup>th</sup> in Punjabi medium.

**TABLE 1: The Background Characteristics of the Respondents**

	Frequency	Percent
<b>Academic Session</b>		
2013-14	104	19.8
2014-15	120	22.9
2015-16	140	26.7
2016-17	160	30.5
TOTAL	524	100.0
<b>Academic Performance</b>		
SUPER	116	22.1
AVERAGE	280	53.4
BELOW AVERAGE	128	24.4
TOTAL	524	100.0
<b>Gender</b>		
MALE	169	32.3
FEMALE	355	67.7
TOTAL	524	100.0
<b>Caste</b>		
SC	144	27.5
GENERAL	380	72.5
TOTAL	524	100.0
<b>Region</b>		
RURAL	181	34.5
URBAN	343	65.5
TOTAL	524	100.0
<b>Medium</b>		
ENGLISH	298	56.9
PUNJABI	226	43.1
TOTAL	524	100.0

**HYPOTHESIS ONE:** *There is no significant relationship in gender between SC and general school students' academic performance in Science stream.*

**TABLE 2. Summary of the Results Showing the Effect of Caste on the Students' Academic Performance in Science Stream**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	71.315	1	71.315	215.920	.000
Within Groups	172.410	522	.330		
Total	243.725	523			

Table 2 reveals that SC and General students differed significantly ( $F=215.92$ ,  $p<0.05$ ,  $df\ 1/522$ ) from one another with regard to their academic performance in science stream in the selected government senior secondary schools in Punjab State. We reject the null hypothesis and accept the alternate hypothesis which stated that caste factor has influenced students' academic performance in science stream.

**HYPOTHESIS TWO:** *There is no significant difference in students' academic performance on the basis of gender in Science stream.*

**TABLE 3. Summary of the Results Showing the Effect of Gender on the Students' Academic Performance in Science Stream**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.526	1	12.526	28.281	.000
Within Groups	231.199	522	.443		
Total	243.725	523			

Table 3 reveals that male and female students differed significantly ( $F=28.281$ ,  $p<0.05$ ,  $df\ 1/522$ ) from one another with regard to their academic performance in science stream in the selected government senior secondary schools in Punjab State. We reject the null hypothesis and accept the alternate hypothesis which stated that gender factor has influenced students' academic performance in science stream.

**HYPOTHESIS THREE:** *There is no significant difference in students' academic performance belonging to rural and urban area in Science stream.*

**TABLE 4. Summary of the Results Showing the Effect of Region on the Students' Academic Performance in Science Stream**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	29.525	1	29.525	71.953	.000
Within Groups	214.200	522	.410		
Total	243.725	523			

Table 4 reveals that rural and urban students differed significantly ( $F=71.953$ ,  $p<0.05$ ,  $df\ 1/522$ ) from one another with regard to their academic performance in science stream in the selected government senior secondary schools in Punjab State. We reject the null hypothesis and accept the alternate hypothesis which stated that region factor has influenced students' academic performance in science stream.

**HYPOTHESIS FOUR:** *There is no significant difference in the academic performance of students in Science stream Groups on the basis of class 10th passed in English and Punjabi medium.*

**TABLE 5 . Summary of the Results Showing the Effect of Medium of class 10<sup>th</sup> on the Students' Academic Performance in Science Stream**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	69.005	1	69.005	206.163	.000
Within Groups	174.720	522	.335		
Total	243.725	523			

Table 5 reveals that students who passed 10th Class in Punjabi and English medium differed significantly ( $F=206.163$ ,  $p<0.05$ ,  $df\ 1/522$ ) from one another with regard to their academic performance in science stream in the selected government senior secondary schools in Punjab State. We reject the null hypothesis and accept the alternate hypothesis which stated that medium factor has influenced students' academic performance in science stream.

## 8. DISCUSSION OF THE FINDINGS

The four hypotheses that were formulated are statistically significant which give us a good significant base of making our decision. This means that, academic performance of the students belonging to SC caste and rural area in science stream in the selected government senior secondary schools is very low as compared to General and urban area students. Also, those students who passed class 10th in English medium have shown good academic performance as compared to those students who have passed class 10<sup>th</sup> in Punjabi Medium.

It is also clear that female students are performing better as compared to male students. It can be seen that number of students belonging to SC caste and rural area in science stream is very low as compared to General and urban students. Also the students passing out class 10<sup>th</sup> from the Punjabi medium school are not showing keen interest in taking science stream.

## 9. RECOMMENDATIONS

It is recommended that special attention should be given to students belonging to SC and rural area. The current facilities that are provided to these students are not working properly to make these students perform well. In government schools, mathematics and science subjects should be taught in English medium. Male students need special counseling so that they perform well in science stream. Furthermore, it is recommended that educationists should make use of these findings into ways of making practical applicable policies.

## 10. ACKNOWLEDGMENTS

We wish to express our indebtedness to Dr. P. C. Garg, Professor, Department of Statistics, Punjabi University, Patiala for his constant encouragement and many

valuable suggestions.

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